

Wednesday, 9/12/2007 11:17:36 AM  
Eric Charbonneau

## Process Sheet

Customer : CU-DAR001 Dart Helicopters Services

Drawing Name : 212 X-TUBE LOW NARROW AFT

Job Number : 34641

Estimate Number : 13019

P.O. Number :

This Issue : 9/12/2007 S.O. No. :

Prsht Rev. : NC

First Issue : 1 / Type : LANDING GEAR

Previous Run :

Written By : 

Checked &amp; Approved By :

Comment : Est Rev:A New Issue 07.09.12 EC verified by: JLM

Part Number : D212664247

Drawing Number : D212-664-247 U/R

Project Number : LG0009

Drawing Revision : U/R

Material :

Due Date : 9/19/2007

**PROTOTYPE****FOR ENGINEERING USE ONLY**

Qty: 2 Um: Each

Additional Product

Job Number:



Seq. #: Machine Or Operation:

Description :

1.0 DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D212-664-247 CHG001

N/A 07.09.14

2.0 D6008132P

Crosstube extrusion



Comment: Qty.: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6008-132 Crosstube 25667

Check OD = 3.250"; ID = 2.375"

CERTIFICATE OF CONFORMITY  
REQUIRED

SF 07/08/31

3.0 MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: 1-TURN AS PER FOLIO FA706 &amp; DWG D212-664-247,

FOLIO REV: \_\_\_\_\_

DWG REV: \_\_\_\_\_

2-DEBURR AS REQUIRED

SF 07/08/31

4.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

SF 07/08/31

Date: Wednesday, 9/12/2007 11:17:36 AM  
User: Eric Charbonneau

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW AFT

Job Number: 34641

Part Number: D212664247

Job Number:



Seq. #: Machine Or Operation: Description :

5.0

QC8

SECOND CHECK



ENGINEERING  
APPROVAL



Comment: SECOND CHECK

JP 07.09.03

J.F. 07/09/03

(2)

6.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

DP 7-9-3

(2)

7.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

JP 07.09.03

(2)

8.0

HAND FINISHING 1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

nm 07 09 03

(2)

9.0

QC3/5

INSPECT WORK/WING WALK



Comment: Inspect work & Chemical conversion Coat

JP 07.09.03

(2)

JP 07.09.03

(2)

10.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D212-664-247 using CNC bender program and Folio FT

EL 7-9-03

(2)

11.0

QC6

DIMENSIONAL CHECK



ENGINEERING  
APPROVAL



Comment: DIMENSIONAL CHECK

JP 07.09.18

(2)

12.0

D36601

CUFF



Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)

CUFF

Batch: 34707

DP 7-9-30

CERTIFICATE OF CONFORMITY  
REQUIRED

(4)

CHOWAN  
JCM 10114

10114

47

10114

47

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW AFT

Job Number: 34641

Part Number: D212664247

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill Rivet holes as per Dwg D212-664-247 using DT8972.

2-Drill pilot holes in tube as per Dwg D212-664-247

3-Ream hole to finish size in tube as per Dwg D212-664-247

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-247

*[Handwritten signature]*  
7-9-20

14.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat Tube & Cuffs as per QSI 005 4.1

*[Handwritten signature]*  
7-9-20

15.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

*[Handwritten signature]*  
7-9-20

16.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

*[Handwritten signature]*  
07.09.20

17.0

OUTSIDE SERV.10

OUTSIDE SERVICES -LG



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038

Issue P/O: \_\_\_\_\_ LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

N/A *[Handwritten signature]*  
07.09.20

18.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

N/A *[Handwritten signature]*  
07.09.20

Date: Wednesday, 9/12/2007 11:17:36 AM  
User: Eric Charbonneau

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW AFT

Job Number: 34641

Part Number: D212664247

Job Number:



Seq. #: Machine Or Operation: Description :

19.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: Inspect for damage & ensure results are as per Dwg D412-664-203

N/A 07.09.20

20.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Rivet Cuffs as per Dwg D212-664-247. with Sika flex in Between tube & Cuff

A/R SIKAFLEX -241/-291

BATCH:

ML 105469

DP/

7-9-20

21.0

CR3212466



CHERRY RIVET



Comment: Qty.: 44.0000 Each(s)/Unit Total : 88.0000 Each(s)

CHERRY RIVET

Batch:

104021

DP

7-9-20

22.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

ML 07.09.20

2-Paint outside crosstube with White Imron as per QSI 005 4.2

N/A 07.09.20

23.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

N/A 07.09.20

24.0

D28934



Support



Pro ->

Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)

Support

batch:

32169

ML 07.09.20

CERTIFICATE OF CONFORMITY  
REQUIRED

32169 07.09.20

Permit Levy to D2240-1  
Supports for Aft.

5 slr/21

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW AFT

Job Number: 34641

Part Number: D212664247

Job Number:



Seq. #: Machine Or Operation: Description :

25.0 D3595 063-570 Rubber Cushion (per sq ft)



Comment: Qty.: 0.8295 sf(s)/Unit Total : 1.6590 sf(s)

Rubber Cushion

Cut to .630" X 5.3" Qty 4

Batch: 33834

2507-09-23

CERTIFICATE OF CONFORMITY  
REQUIRED

26.0 MS2192028 Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 8.0000 Each(s)

Clamp

Batch: 105385 25 07-09-23

27.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Assemble as per Dwg D212-664-247

Instal support with magnobond 6398 per dwg D212-664-247,  
cure for 12hrs before packaging.

25 07-09-23

Time & date of application: 0207 11:00

Batch: 104723

25 07-09-23

28.0 QC5 INSPECT WORK TO CURRENT STEP



ENGINEERING  
APPROVAL



Comment: INSPECT WORK TO CURRENT STEP

07.09.23

29.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Identify and pack for shipping as per PPP D212-664-247

FOR ENGINEERING USE ONLY

N/A 07.09.24

30.0 QC21 FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

FOR ENGINEERING USE ONLY

07.09.25

Job Completion



W/O 00206

07.09.28

PARTS LIST:

Qty	Part Number	Description
X	D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
1	D6008-129	CROSSTUBE
2	D2940-1	SUPPORT
4	D3595-063-530	RUBBER CUSHION
2	D3660-1	CUFF
4	MS21920-28	CLAMP (OR MS21920-30)
44	CR3212-4-06	RIVET (OR M7885/3-4-06)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6008-129  
FINISHED LENGTH = 128.27±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

PRELIMINARY ISSUE

07.07.26

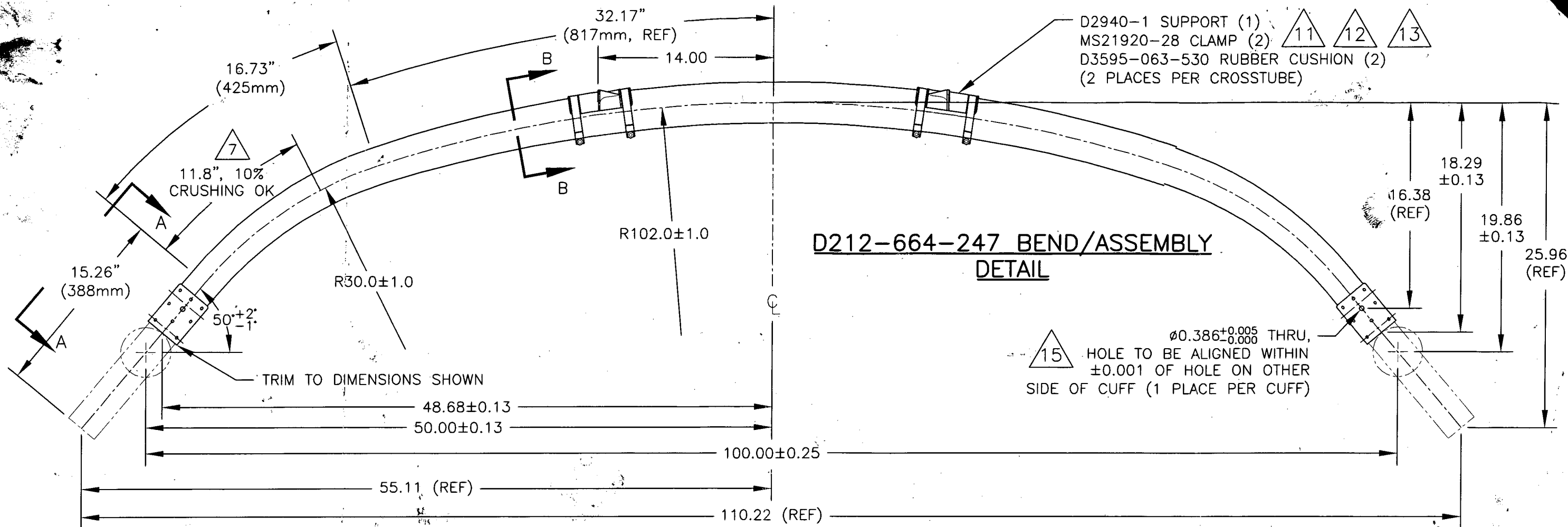
A		07.07.07	NEW ISSUE	
DESIGN	qp	DRAWN BY	qp	<b>DART</b> DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED		APPROVED		DRAWING NO. D212-664-247 REV. A SHEET 1 OF 3
DATE	07.07.07	TITLE	CROSSTUBE (205/212 LOW AFT) SCALE 1:8	

COPYRIGHT © 2007 BY DART AEROSPACE LTD.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

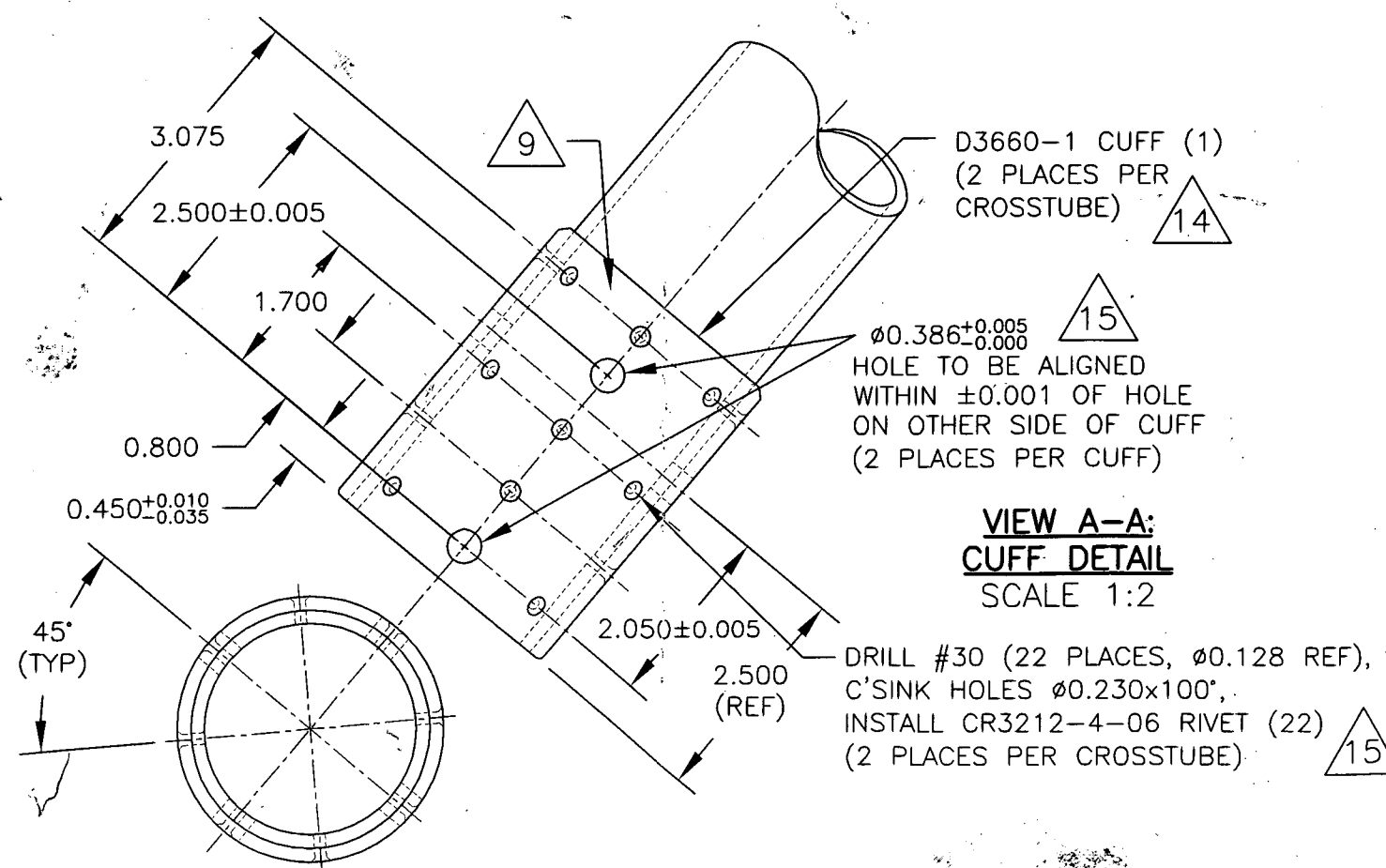






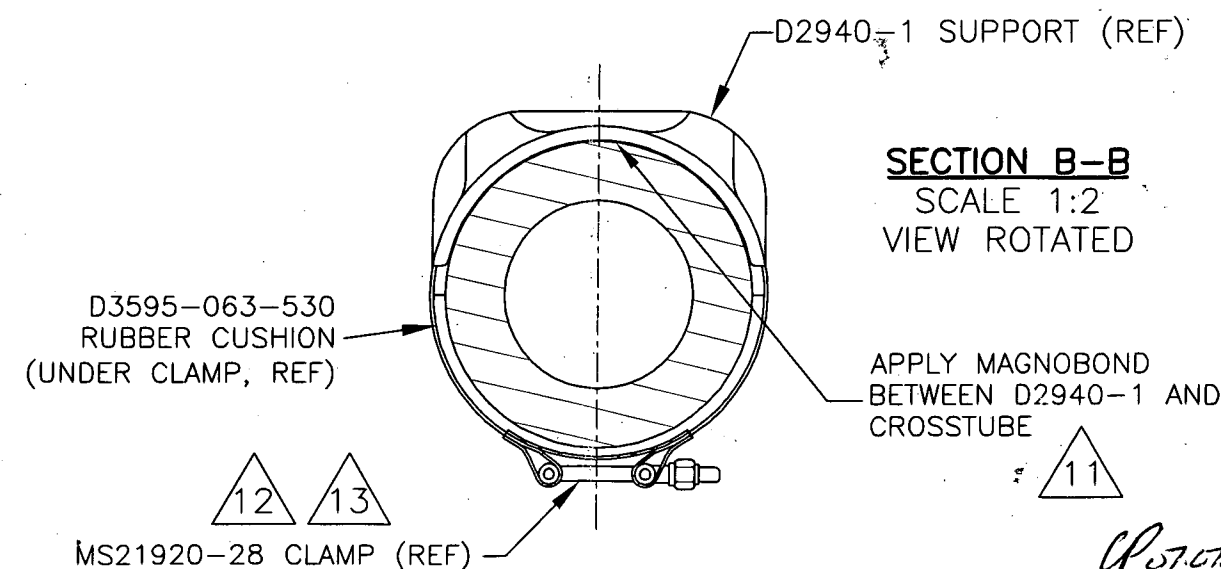
## D212-664-247 BEND/ASSEMBLY DETAIL

15  $\varnothing 0.386 \pm 0.005$  THRU,  
HOLE TO BE ALIGNED WITHIN  
 $\pm 0.001$  OF HOLE ON OTHER  
SIDE OF CUFF (1 PLACE PER CUFF)



### VIEW A-A: CUFF DETAIL SCALE 1:2

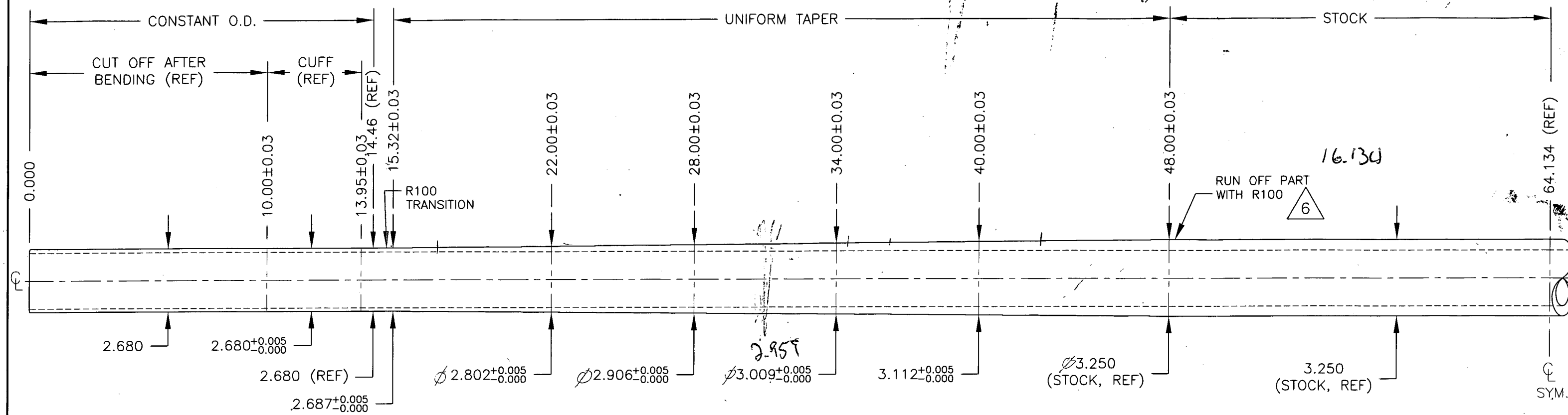
DRILL #30 (22 PLACES,  $\varnothing 0.128$  REF),  
C'SINK HOLES  $\varnothing 0.230 \times 100^\circ$ ,  
INSTALL CR3212-4-06 RIVET (22)  
(2 PLACES PER CROSSTUBE)



**PRELIMINARY ISSUE**

COPYRIGHT © 2007 BY DART AEROSPACE LTD.		DESIGN <i>qp</i>	DRAWN BY <i>qp</i>	<b>DART</b>	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED	APPROVED	DRAWING NO. D212-664-247	REV. A SHEET 2 OF 3
DATE 07.07.07		TITLE CROSSTUBE (205/212 LOW AFT)		SCALE 1:8	





# D212-664-247 MACHINING DETAIL

PRELIMINARY ISSUE

07.07.26

COPYRIGHT © 2007 BY DART AEROSPACE LTD.		DESIGN <i>qp</i>	DRAWN BY <i>qp</i>	<b>DART</b>	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED	APPROVED	DRAWING NO. D212-664-247	REV. A SHEET 3 OF 3
DATE 07.07.07		TITLE CROSSTUBE (205/212 LOW AFT)		SCALE 1:4	



<b>DART AEROSPACE LTD</b>	<b>Work Order:</b> 00206
<b>Description:</b> Crosstube Assembly	<b>Part Number:</b> 0212664247-2
<b>Inspection Dwg:</b> 0212/664-247 Rev: A	<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☒ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	3.2500	+ .010	3.250				
	3.112	+ .005 - .000	3.115				
	3.009	"	3.012				
	3.906	"	2.909				
	2.802	"	2.805				
	2.687	"	2.690				
	2.680	"	2.683				
SIDE B	128.27	+ .020	128.27				
	3.250	+ .010	3.250				
	3.112	+ .005 - .000	3.115				
	3.009	"	3.012				
	3.906	"	2.909				
	2.802	"	2.805				
	2.687	"	2.690				
	2.680	"	2.683				


<b>Measured by:</b> JLF	<b>Audited by:</b> JF.	<b>Prototype Approval:</b> [Signature] N/A
<b>Date:</b> 07/08/31	<b>Date:</b> 07/09/03	<b>Date:</b> N/A 07/09/03
<b>Rev</b> A	<b>Date</b>	<b>Change</b> New Issue
<b>Revised by</b> KJ/JLM		<b>Approved</b>

<b>DART AEROSPACE LTD</b>	<b>Work Order:</b> 00206
<b>Description:</b> Crosstube Assembly	<b>Part Number:</b> D212664247-1
<b>Inspection Dwg:</b> D212664-247 Rev: A	<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article     ☒ Prototype

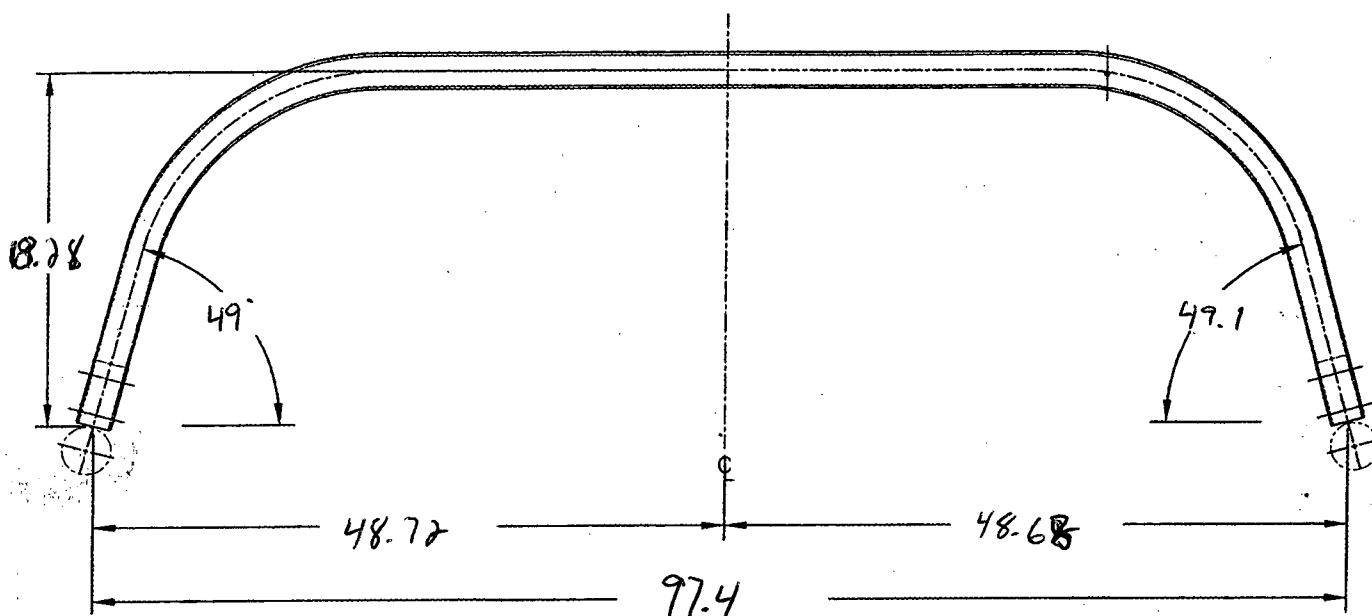
	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	3.250	+0.010	3.250				
	3.112	+0.005 -0.000	3.113				
	3.009	"	3.000				
	2.906	"	2.909				
	2.802	"	2.807				
	2.687	"	2.680				
	2.680	"	2.684				
SIDE B	128.27	+0.020	128.27				
	3.250	+0.010	3.250				
	3.112	+0.005 -0.000	3.112				
	3.009	"	3.010				
	2.906	"	2.907				
	2.802	"	2.803				
	2.687	"	2.687				
	2.680	"	2.683				

<b>Measured by:</b> S.F.	<b>Audited by:</b> J.F.	<b>Prototype Approval:</b>  N/A
<b>Date:</b> 07/08/31	<b>Date:</b> 07/08/31	<b>Date:</b> 07/08/31

<b>Rev</b>	<b>Date</b>	<b>Change</b>	<b>Revised by</b>	<b>Approved</b>
A		New Issue	KJ/JLM	

DART AEROSPACE LTD	Work Order:	00206-1
		34641A
Description: 212 AFT LOW	Part Number:	212-664-247
Inspection Dwg: 17212-664-247 Rev: A. Prelim. Issue		Page 1 of 1

Required Dimension	Min	Max
Height		
1/2 Span		
Angle		
Total Span		



Comments

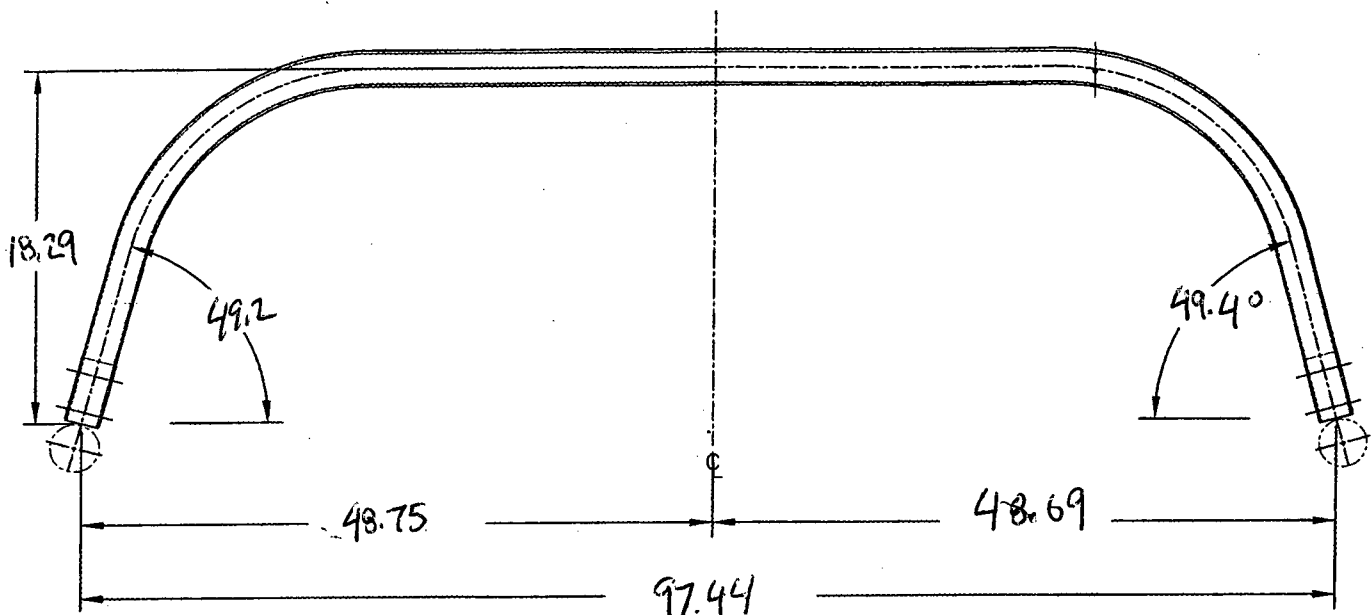
QC15 Inspection	CP
Date	07.09.18

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	



DART AEROSPACE LTD	Work Order: 34641 B
Description: 212 AFT LOW	Part Number: D212-664-247
Inspection Dwg: D212-664-247 Rev: A. Prelim Issue	Page 1 of 1

Required Dimension	Min	Max
Height		
1/2 Span		
Angle		
Total Span		



Comments

QC15 Inspection	CP
Date	07.09.18

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	

